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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,589	10/30/2003	Yong Chen	10992517-3	8317

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EXAMINER	
WEISS, HOWARD	

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 04/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/697,589	CHEN ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Attorney's Docket Number: 10992517-3

Filing Date: 10/30/03

Continuing Data: Division of 10/104,348 (3/22/02 now U.S. Patent No. 6,699,779)

Claimed Foreign Priority Date: none

Applicant(s): Chen et al. (Williams)

Examiner: Howard Weiss

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. (U.S. Patent No. 6,707,098).

Hofmann et al. show most aspects of the instant invention (e.g. Figure 1) including:

- a first elongated nanowire **101** on an insulating surface (not shown)
- a second elongated nanowire **107** at right angles to said first nanowires
- a gap, about between 0.4 and 10 nm, filled with material **103** which stores electric charge

In references to the claimed gap dimensions, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corporation of America v. Banner , 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)*; See MPEP 2144.05. The gap dimension in Hofmann et al. (10.9 nm) is close to the ranges claimed that one skilled in the art would have expected them to have the same properties.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. and Shin et al. (U.S. Patent No. 6,515,339).

Hofmann et al. show most aspects of the instant invention (Paragraph 2) except for the first and second nanowires forming a transistor having source, drain and gate. Shin et al. teach (e.g. Figure 25) to form a transistor from nanowires as a well known device in the art for nanotechnology applications (Column 1 Lines 9 to30). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a transistor from nanowires as taught by Shin et al. in the device of Hofmann et al. as a well known device in the art for nanotechnology applications.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. and Jin (U.S. Patent No. 6,286,226).

Hofmann et al. disclose most aspects of the claimed invention (Paragraph 2) except for the use of Carbon nanotubes for the nanowire material instead of semiconductor material chosen from the group as claimed. Jin teaches (Column 6 Lines 16 to 22) that semiconductor material is an equivalent nanowire material known in the art. Therefore, because these two nanowire materials were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a semiconductor material for the carbon nanotubes.

5. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann et al. and Yano et al. (JP 04-097564).

Hofmann et al. disclose most aspects of the claimed invention (Paragraph 2) except for the gap filled with material having an electric dipole moment and the first and second nanowires forming a two-electrode memory switching device. Yano et al. teach (e.g. Figure 17) to fill a gap with material **52** having an electric dipole moment and the first **58** and second **57** nanowires forming a two-electrode memory switching device to permit high-speed information processing by extremely small electric consumption (see PURPOSE). It would have been obvious to a person of ordinary skill in the art at the time of invention to fill a gap with material having an electric dipole moment and the first and second nanowires forming a two-electrode memory switching device as taught by Yano et al. in the device of Hofmann et al. to permit high-speed information processing by extremely small electric consumption.

Response to Arguments

6. Applicant's arguments filed 1/24/05 have been fully considered but they are not persuasive. The Applicants state that Hofmann et al. do not show both the first and second elongated nanowires on the insulating surface but on different surfaces and that the nanowires are parallel on these surfaces. However, Hofmann et al. does show the nanowires "on" the substrate surface, if the claims are given their broadest reasonable interpretation. Although a claim should be interpreted in light of the specification disclosure, it is generally considered improper to read limitations contained in the specification into the claims. See *In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969)* and *In re Winkhaus, 527 F.2d 637, 188 USPQ 129 (CCPA 1975)*, which discuss the premise that one cannot rely on the specification to impart limitations to the claim that are not recited in the claim. Words in a claim are given their broadest, ordinary and customary meaning unless explicitly used or defined differently by the applicant. In the instant case, the examiner interprets the phase "on said insulating substrate" to include instances where there may be other features or

layers between the substrate and the nanowires (for example, a book is still considered on a table even if there are a few layers of papers between the book and table).

Where an applicant chooses to be his or her own lexicographer and defines terms with special meanings, he or she must set out the special definition explicitly and with "reasonable clarity, deliberateness, and precision" in the disclosure to give one of ordinary skill in the art notice of the change. See *Teleflex Inc. v. Ficosa North America Corp.*, 299 F.3d 1313, 1325, 63 USPQ2d 1374, 1381 (Fed. Cir. 2002), *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001), and MPEP § 2111.01. Pursuant to 35 U.S.C. § 112, 2nd paragraph, "[i]t is applicant's burden to precisely define the invention, and not the [examiner's]." *In re Morris*, 127 F.3d 1048, 1056, 44 USPQ2d 1023, 1029 (Fed. Cir. 1997). Therefore, it would **not** be proper for the examiner to give words of the claim special meaning when no such special meaning has been defined by the applicant in the written description. Furthermore, it would **not** be proper for the examiner to allow a claim and issue the application with an examiner's statement of reasons for allowance setting forth the special definition given to the words of the claim when no such special definition has been defined by the applicant in the written description.

In reference to the gap dimensions, where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).* The Applicant has not established the criticality of gap dimensions stated since the Specification states that these dimensions are "typically 0.4-10 nm."

In reference to Shin et al.'s nanowire transistors, Figure 20, for example, shows transistors with nanowire source **251** and drain **252**. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

   A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

10. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 295, 310	thru 4/5/05
Other Documentation: none	
Electronic Database(s): EAST	thru 4/5/05

HW/hw
6 April 2005

Howard Weiss
Primary Examiner
Art Unit 2814